Part 192
Subparts L, J & K

MAOP Testing & Uprating

MAOP, Testing, & Uprating

- **Are All Linked Together**
- **MAOP = Maximum Pressure Allowed By Regulations (192.619, 621, 623)**
- **MAOP Must Be Determined By Operator for Each Pipeline or Segment**

Factors Affecting MAOP

1. **Class Location (Transmission)**
2. **Design (Pipe/Components)**
3. **System Test**
4. **O&M History**
5. **Overpressure Protection**

MAOP For Pipelines Before 1970

- **System Design (usually Trans.)**
- **Test Pressure (Trans. & Dist.)**
- **Operating History (MOP) ~ 1965-1970 (Trans. & Dist.)**
- **Subject to Class Location Change (Trans.)**

MAOP For Pipelines After 1970

- **System Design (Trans. & Dist.)**
- **Test Pressure (Trans. & Dist.)**
- **Subject to Class Location Change (Trans.)**
- **Types and Settings for Overpressure Protection (Key for Dist.)**

High Pressure Distribution System

A distribution system in which the gas pressure in the main is higher than the pressure provided to the customer. (Service Regulators)

§192.621 MAOP: High - Pressure Distribution Systems

Lowest **of the following:**

1. **Design**
2. **De-rated Test Pressure**
3. **60# - unless service lines equipped with pressure limiting devices meeting §192.197(c) (basically,Service Regulators)**

For MAOP greater than 60 psig, must use service regulator and additional overpressure protection (choose one):

1. **Series regulator with intermediate relief valve or automatic shutoff**
2. **Monitoring regulator**
3. **Internal or separate valve vented to outside (MAOP cannot exceed 125 psig)**
4. **Automatic shutoff with manual reset**

Part 192 – Subpart J

Test Requirements

§192.501 ~ Scope

- **Non- Retroactive Subpart**
- **Minimum Test Requirements**
- **Strength-Tests (Transmission)**
- **Leak-Tests (Distribution)**

§192.503 ~ General

- **Test all Lines (New, Replacements, Relocations)**
- **Meet Requirements of Subpart J and §192.619 (Steel P/L ≥ 100 psig) to Establish/Substantiate MAOP**

§192.503 ~ General

- **Test Medium =**
  - Liquid (Water)
  - Inert Gas
  - Natural Gas

  - **Compatible with P/L Material**
  - **Nonflammable (Except Natural Gas)**

§192.503 ~ General

Maximum Hoop Stress Allowed as Percentage of SMYS

Class Location	Natural Gas	Air or Inert Gas
1	80	80
2	30	75
3	30	50
4	30	40

§192.503 ~ General

- **Tie-In Joints Exempt from Pressure Testing**
- **NDT Tie-In Welds (≥20 % SMYS)**
- **Leak Test Non-Welded Joints**

§192.505 ~ Strength Test Requirements

- **Steel Pipelines**
- **Operating at Hoop Stress ≥ 30% SMYS**

§192.505 ~ Strength Test Requirements

- **Paragraph (a)** –Test per 192.619 (a)(2)(ii) to Establish/Substantiate MAOP

	Factors[1], segment		
Class location	Installed before (Nov. 12, 1970)	Installed after (Nov. 11, 1970)	Covered under §192.14
1	1.1	1.1	1.25
2	1.25	1.25	1.25
3	1.4	1.5	1.5
4	1.4	1.5	1.5

§192.505 ~ Strength Test Requirements

- **Paragraph (b) –**

  Stations (Compressor/Regulator/Measuring) in Class 1 or 2 Locations

  ---- must be ----

  Tested to Class 3 Location Requirements (150% MAOP of Station)

§192.505 ~ Strength Test Requirements

- **Paragraphs (c) & (e) –**

  Maintain Test Pressure for at least 8 Hours

  ---- except ----

  4 - Hour Minimum for Fabricated Units & Short Sections of Pipe Impractical to Test After Installation

§192.505 ~ Strength Test Requirements

- **Question--**

What is a "Short Section of Pipe"?

Important to consider when using lengths ("pups") of pre-tested emergency pipe for repair.

§192.505 ~ Strength Test Requirements

- **Paragraph (d) –**

  Individual Components Don't Require Post-Installation Test

  ---- if ----

  Pre-Tested or QC'ed by Manufacturer

§192.507 ~ Test Requirements

- 100 psig ≥ Pipeline MAOP < 30% SMYS
- Except for Service Lines & Plastic Pipelines
- Strength and Leak Test

§192.507 ~ Test Requirements (Steel Lines ≥ 100 psig)

- Test per 192.619 (a)(2)(ii) to Establish/Substantiate MAOP

	Factors[1], segment		
Class location	Installed before (Nov. 12, 1970)	Installed after (Nov. 11, 1970)	Covered under §192.14
1	1.1	1.1	1.25
2	1.25	1.25	1.25
3	1.4	1.5	1.5
4	1.4	1.5	1.5

§192.507 ~ Test Requirements

- **Paragraph (a) –**

Test Procedure That Will Ensure Discovery of Potentially Hazardous Leaks

§192.507 ~ Test Requirements

- **Paragraph (b) –**

  Additional Requirements if ≥ 20% SMYS & Air, Inert Gas, or Natural Gas as Test Medium:

  1. Conduct Leak Test at Pressure Between 100 psig and 20% SMYS; or

  2. Walk Line for Leaks While Holding Pressure at @ 20% SMYS

§192.507 ~ Test Requirements

- **Paragraph (c) –**

  Maintain at or above Test Pressure for Minimum of One Hour

§192.509 ~ Test Requirements

- Pipeline MAOP < 100 psig
- Except for Service Lines & Plastic Pipelines
- Leak Test

§192.509 ~ Test Requirements

- **Paragraph (a) –**

Test Procedure That Will Ensure Discovery of Potentially Hazardous Leaks

§192.509 ~ Test Requirements

- **Paragraph (b) –**

  1. Mains to Operate < 1 psig, Test to 10 psig

  2. Mains to Operate ≥ 1 psig, Test to 90 psig

No Time Requirement Specified

§192.511 ~ Test Requirements Service Lines (Other Than Plastic)

- **Paragraph (a) –**

  1. Leak Test Prior to Placing in Service

  2. If Feasible, Include Connection to Main

  3. If Not Feasible, Test Connection to Main In-Service at Operating Pressure

§192.511 ~ Test Requirements Service Lines (Other Than Plastic)

- **Paragraphs (b) & (c) –**

  1. Service Lines > 1 psig and ≤ 40 psig,
     Leak Test to Minimum of 50 psig

  2. Service Lines > 40 psig,
     Leak Test to Minimum of 90 psig

  3. If Steel Service Line ≥ 20% SMYS,
     Test per §192.507

§192.513 ~ Test Requirements Plastic Pipelines

- **Paragraphs (a) and (b) –**

1. **All** Plastic Lines (Transmission, Mains, Services)

2. Use Test Procedure That Will Ensure Discovery of Potentially Hazardous Leaks

§192.513 ~ Test Requirements Plastic Pipelines

- **Paragraphs (c) and (d) –**

  1. Test Pressure = Higher of 150% MAOP or 50 psig, Not to Exceed 3 X Design Pressure (§192.121)

  2. During Test, Temp. of Plastic Cannot Exceed Higher of 100° F. or Temp. Used to Determine HDB

§192.515 ~ Environmental & Safety Requirements

1. Measures to Protect Employees & General Public.

2. Limit Access to Test Area While Above 50% SMYS.

3. Dispose of Test Medium in Environmentally-Safe Manner.

§192.517 ~ Records

- Required for Tests per §192.505 & §192.507
- Retain for Life of Pipeline or Segment
- Specific Information Required

§192.517 ~ Records

- Name of Operator/ Employee/Test Company
- Test Medium
- Test Pressure
- Test Duration
- Charts, Other Pressure Records
- Elevation Profiles
- Leaks, Failures & Disposition

§192.517 ~ Records

- Required for Tests per §192.509, 511,& 513
- Retain for Minimum of 5 Years
- Per Amendment 93

§192.725 ~ Test Requirements for Reinstating Service Lines

1. Retroactive – Applies to *All* Service Lines.

2. “Disconnected” Service Lines Must be Tested in Same Manner as New Service Lines.

3. Test from Point of Disconnection to Service Line Valve (Unless Service to Customer Maintained).

Part 192 – Subpart K

Uprating

What Is Uprating?

Increasing MAOP For Existing Pipelines While Maintaining Service (Retroactive Subpart)

Why Uprating?

To Assist Operators With P/L Segments Caught By 5-year MOP Between 1965 - 1970

Uprating Code Sections

- **192.553 ~ General Requirements.**
- **192.555 ~ P/L's ≥ 30% SMYS**
- **192.557 ~ P/L's < 30% SMYS, Non-Steel Materials**

192.553 General Requirements

- **Controlled Pressure Increases**
- **Leak Checks After Increases**
- **Repair or Monitor Leaks Found**
- **Records for Life of Segment**
- **Written Uprating Plan/Procedure**
- **Limitation on Increase in MAOP**

192.557

Uprating to a Pressure <30% SMYS (Steel Pipelines); Other Non-Steel Materials

192.557(b) ~ Before Uprating

- **Review Design, O&M**
- **Perform Leakage Survey (if > One Year Since Last Survey)**
- **Repair or Monitor Leaks**
- **Make Repairs, Replacements, Alterations**

192.557(b) ~ Before Uprating

- **Reinforce/Anchor Exposed Offsets, Bends, Dead Ends**
- **Isolate From Lower Pressure Segments**
- **Install Service Regulators (Low-Pressure Distribution Systems)**

192.557(c) ~ Pressure Increments

To Increase Pressure, Fewer Of --

1) **10 psig increments**
2) **25% of Total Pressure Increase**
3) **At Least 2 Increments for Low-Pressure Distribution**

192.557(d)

- **Additional Requirements for Cast Iron / Ductile Iron Segments**

Uprating ~ Major Concerns

- **What test pressure needed for new MAOP?**
- **Design not retroactive, Uprating is**
- **Less stringent requirements for old vs. new**
- **Some design/construction defects may not be apparent**
- **Uprating requirements confusing, difficult to read**